UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/748,188	12/27/2000	Tadayoshi Iijima	OKA-0019	2973

74384 7590 05/05/2009

Cheng Law Group, PLLC
1100 17th Street, N.W.
Suite 503
Washington, DC 20036

EXAMINER	
BERNATZ, KEVIN M	
ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
05/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TADAYOSHI IIJIMA

Appeal 2009-2318
Application 09/748,188
Technology Center 1700

Decided:[1] May 4, 2009

Before BRADLEY R. GARRIS, CATHERINE Q. TIMM, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

I. STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 2, 3, and 8. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Claim 8 is illustrative of the subject matter on appeal:

8. A transparent conductive film comprising:

a compressed layer on a support, said compressed layer having conductive particles and a resin, said resin being approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive particles, said compressed layer formed by compressing the conductive particles and the resin on the support with a compression force of at least $44N/mm^2$,

wherein said compressed layer further comprises an impregnated transparent substance.

The Examiner maintains, and Appellant appeals, the rejection of claims 2, 3, and 8 under 35 U.S.C. § 103(a) as unpatentable over Yukinobu (US 5,411,792, issued May 2, 1995) in view of Sumitomo Cement KK (JP 6[1994]-87631, pub. Mar. 29, 1994) as translated.

Appellant does not argue any claim apart from the others. In accordance with 37 C.F.R. § 41.37(c)(1)(vii), we select a single claim, i.e., claim 8, to decide the issues on appeal.

II. DISPOSITIVE ISSUES

Has Appellant shown reversible error with regard to:

A. the Examiner's finding that the process limitation of forming by compressing at a force of at least $44N/mm^2$ as recited in claim 8 does

not patentably distinguish the claimed structure from that of Yukinobu, and

B. the Examiner's conclusion that Appellant's showing of unexpected results is inadequate to overcome the prima facie case of obviousness?

III. FINDINGS OF FACT

The following enumerated findings of fact ("FF") are of particular relevance:

1. The object of Yukinobu, Sumitomo Cement, and Appellant is to provide a transparent conductive layer with low electric resistance and high transparency (Yukinobu, col. 2, ll. 12-16; Sumitomo Cement, ¶ [0006]; Spec. 8:7-13).
2. The transparent conductive layer is to be used, for instance, as a transparent electrode in a liquid crystal display or other type of display, touch switches or touch panels and transparent electromagnetic-wave shielding films (Yukinobu, col. 1, ll. 6-11; Sumitomo Cement, ¶ [0001]; Spec. 1:6-13).
3. The Examiner finds that Yukinobu discloses a transparent conductive film including a compressed layer having conductive fine particles and a resin (Ans. 4).
4. The film of Yukinobu is an ink containing the particles and resin dispersed in a liquid similarly to Appellant's paint (*Compare* Yukinobu, col. col. 1, ll. 29-33 and col. 5, ll. 14-18 to Spec. 10:2-8, 12:17-19 and para. bridging 16 and 17). Sumitomo Cement describes a similar coating containing particles and resin dispersed in a solution (Sumitomo Cement ¶ [0021]). Yukinobu additionally calcines the ink (col. 3, ll. 1-3).

5. Yukinobu teaches a process of forming a compressed layer similarly to Appellant's method in which a conductive ink is compressed by rolling with a steel roller (*Compare* Spec. 12: 17-19 and 24:1-6 to Yukinobu, col. 2, l. 68 to col. 3, l. 1; col. 13, ll. 34-37, col. 14, ll. 28-30 and ll. 41-43).
6. The Examiner further finds that the exact pressure used by Yukinobu to compress the layer "is not deemed to produce an unobvious difference in structure." (Ans. 5.)
7. The Examiner finds, and Appellant does not dispute, that Yukinobu recognizes that the concentration of resin in the conductive ink layer is a results effective variable that affects the overall conductivity, haze, and transparency of the film (Ans. 5; Br. 5 and Reply Br.1-4).
8. The Examiner and Appellant agree that Sumitomo Cement describes including resin in a concentration range encompassing the claimed range of 0.03-9.3 parts by volume with respect to 100 parts by volume of conductive particles (Ans. 7; Br. 5; Reply Br. 4-5).
9. Yukinobu explains that the conventional printing method for applying the conductive ink to a substrate was incapable of satisfying the two requirements of low electrical surface resistance and optical transparency because optimizing the resin concentration for lower electrical resistance would result in increasing haze (lowering transparency) and optimizing for transparency would increase electrical resistance (Yukinobu, col. 1, ll. 29-59).
10. Yukinobu, similarly to Appellant, uses large amounts of conductive particles (low amounts of resin) to lower the surface electrical resistance. Yukinobu, similarly to Appellant, teaches that using large

amounts of conductive particles (low amounts of resin) results in high porosity and haze in the film. Both Yukinobu and Appellant solve the haze problem with an overcoat liquid that impregnates the pores to reduce light scattering and improve transparency. (*Compare* Yukinobu, col. 4, ll. 18-34 to Spec. 16:9-12 and para. bridging 26 and 27.)

11. Appellant relies upon a comparison of Examples 1-6 to Comparative Examples 9-12 as showing unexpected results (Br. 6). Tables 1 and 2 reproduced on pages 47-48 reproduce electrical resistance and haze values for the relied upon examples. Tables 1 and 2 are reproduced below:

Table 1

	resin/ conductive fine particles		pressure (N/mm^2)	conductive layer thickness (μm)	Before impregnation			After impregnation	
	weight ratio	volume ratio			electric resistance value (kΩ)	haze (%)	90° peel test	electric resistance value (kΩ)	haze (%)
Example 1	0.01/100	0.037/100	347	1.0	80	10	○	80	2
Example 2	0.01/100	0.037/100	183	1.0	130	11	○	130	2
Comparative Example 1	0.01/100	0.037/100	-	1.7	6500	29	×	5400	4
Example 3	1/100	3.7/100	347	1.0	95	10	○	95	2
Example 4	1/100	3.7/100	183	1.0	140	10	○	140	2
Comparative Example 2	1/100	3.7/100	-	1.7	6400	28	×	5400	4
Example 5	2.5/100	9.3/100	347	1.0	108	7	○	108	2
Example 6	2.5/100	9.3/100	183	1.0	159	9	○	159	2
Comparative Example 3	2.5/100	9.3/100	-	1.6	6300	27	×	5400	4
Example 7	5/100	18.5/100	347	1.0	121	4	○	121	2
Example 8	5/100	18.5/100	183	1.0	184	7	○	184	2
Comparative Example 4	5/100	18.5/100	-	1.4	6200	25	×	5400	4
Example 9	7.5/100	28/100	347	1.0	130	3	○	130	2
Example 10	7.5/100	28/100	183	1.0	194	6	○	194	2
Comparative Example 5	7.5/100	28/100	-	1.3	5900	18	×	5400	3
Example 11	10/100	37/100	347	1.0	135	3	○	135	2
Example 12	10/100	37/100	183	1.0	200	5	○	200	2
Comparative Example 6	10/100	37/100	-	1.3	5400	13	×	5300	3

Table 2

	resin/ conductive fine particles		pressure (N/mm^2)	conductive layer thickness (μm)	Before impregnation			After impregnation	
	weight ratio	volume ratio			electric resistance value (kΩ)	haze (%)	90° peel test	electric resistance value (kΩ)	haze (%)
Example 13	15/100	55/100	347	1.0	190	3	○	190	2
Example 14	15/100	55/100	183	1.0	250	4	○	250	2
Comparative Example 7	15/100	55/100	-	1.2	5000	14	×	5000	3
Example 15	20/100	73/100	347	1.0	270	4	○	270	2
Example 16	20/100	73/100	183	1.0	370	4	○	370	2
Comparative Example 8	20/100	73/100	-	1.2	3300	17	○	3300	3
Comparative Example 9	40/100	147/100	347	1.0	900	11	○	900	2
Comparative Example 10	40/100	147/100	183	1.0	1000	13	○	1000	2
Comparative Example 11	40/100	147/100	-	1.2	1200	27	○	1200	4
Comparative Example 12	100/100	367/100	347	1.0	7200	35	○	7200	4
Comparative Example 13	100/100	367/100	183	1.0	6800	35	○	6800	4
Comparative Example 14	100/100	367/100	-	1.2	3600	41	○	3600	4
Example 17	5/100	19/100	347	1.0	6	3	○	6	1
Example 18	5/100	19/100	183	1.0	8	4	○	8	1

IV. PRINCIPLES OF LAW

"In order to be patentable, a product must be novel, useful and unobvious. In our law, this is true whether the product is claimed by describing it, or by listing the process steps used to obtain it." *In re Brown*, 459 F.2d 531, 535 (CCPA 1972). "[I]t is the patentability of the *product* claimed and *not* of the recited process steps which must be established." *Id.* Therefore, "[w]here a product-by-process claim is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product." *In re Marosi*, 710 F.2d 799, 803 (Fed. Cir. 1983). "[W]hen the prior art evidence reasonably allows the PTO to conclude that a

claimed feature is present in the prior art, the evidence 'compels such a conclusion if the applicant produces no evidence or argument to rebut it.'" *In re Crish*, 393 F.3d 1253, 1259 (Fed. Cir. 2004) (quoting *In re Spada*, 911 F.2d 705, 708 n.3 (Fed. Cir. 1990)). Evidence of an unobvious difference must be commensurate in scope with the claims. *Marosi*, 710 at 803.

An improvement in the art is obvious if "it is likely the product not of innovation but of ordinary skill and common sense." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). Optimization of a variable which is recognized in the prior art to be a result effective variable would ordinarily be the product of ordinary skill within the art. *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Therefore, a prima facie case of obviousness typically exists when the ranges recited in the claim are close to, or overlap, ranges disclosed in the prior art, and is even more compelling when the claimed ranges are narrow ranges from within broader ranges disclosed in the prior art where the broader ranges invite routine optimization. *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003); *see also In re Harris*, 409 F.3d 1339, 1343 (Fed. Cir. 2005)(discussing *Peterson*).

"In general, an applicant may overcome a *prima facie* case of obviousness by establishing 'that the [claimed] range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.'" *Peterson*, 315 F.3d at 1330 (quoting *In re Geisler*, 116 F.3d 1465, 1469-70). In order to properly evaluate whether a property would have been unexpected by one of ordinary skill in the art, the properties that would have been expected must be considered. *Pfizer, Inc. v.*

Apotex, Inc., 480 F.3d 1348, 1371 (Fed. Cir. 2007). "[O]bjective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support." *In re Greenfield*, 571 F.2d 1185, 1189 (CCPA 1978). The showing of unexpected results must be reviewed to see if the results occur over the entire claimed range. *In re Clemens*, 622 F.2d 1029, 1036 (CCPA 1980).

V. ANALYSIS

As a first matter, we cannot agree with Appellant that the Examiner failed to properly consider the process limitation of compressing at a force of at least 44 N/mm^2 (Reply Br. 1-2). As found by the Examiner, Yukinobu teaches applying a compressing force to the conductive ink layer, and, therefore, the only arguable difference is the amount of force applied (FF 5). The Examiner found that the exact pressure used would not have produced an unobvious difference in structure (FF 6). The Examiner provided a reasonable basis to believe that the conductive layer of Yukinobu was the same or substantially similar to that claimed. The Examiner's basis was sufficient to shift the burden to Appellant to establish an unobvious difference.

The similarities in composition and processing further support the reasonableness of the Examiner's determination. The method of compressing is the same or substantially similar as Appellant's method (FF 5). The composition that is subjected to compression is also substantially similar to Appellant's composition (FF 3, 4, and 9) and as are the results each desired to achieve (FF 1-2). Given the similarities in composition and method, the Examiner's conclusion that the compressed layer of Yukinobu is the same or substantially similar to those encompassed by claim 8 was

reasonable such that the burden shifted to Appellant to come forward with evidence that the particular claimed force range, in fact, would result in an unobvious difference in the structure of the layer. Appellant has not established that the Examiner reversibly erred in considering the process language of the claim.

While there is some disagreement between the Examiner and the Appellant with respect to the extent of the range of resin concentration taught by Sumitomo Cement, both the Examiner and Appellant agree that the prior art range overlaps and likely encompasses the claimed range of 0.03-9.3 parts by volume with respect to 100 parts by volume of conductive particles (FF 7). Given the similarities in result desired (FF 1), intended application (FF 2), conductive layer composition (FF 3-4), the fact that the resin concentration is a result effective variable adjusted to affect electrical resistance and transparency (FF 7), and the fact that Yukinobu specifically suggests using large amounts of conductive particles (low amounts of resin) in a similar manner as Appellant (FF 10) provides sufficient evidence that the claimed range is a routine optimization of the concentrations suggested by the prior art. In fact, Appellant does not present any convincing argument to the contrary, but instead relies upon a showing of unexpected results (Br. 5-7 and Reply Br. 2-4).

With regard to the showing of unexpected results, the Examiner properly concludes that the result Appellant alleges is unexpected, in fact, appears to be expected (Ans. 8-9). Yukinobu, in fact, teaches loading the conductive layer with large concentrations of conductive particles (low amounts of resin) to obtain low electrical resistance, compressing that layer, and also overcoating the conductive layer to fill pores and reduce haze (FF

10). Both Yukinobu and Sumitomo Cement provide guidance with regard to resin and particle concentration (FF 8-10) showing that those of ordinary skill in the art understood the affects of concentration on both electrical resistance and transparency, and that they understood how to optimize the concentrations, compress, and overcoat in order to obtain predictable levels of electrical resistance and transparency. The evidence as a whole supports the conclusion of the Examiner.

Moreover, we note that Appellant's examples use pressures significantly higher (183 and 347 N/mm^2) than the claimed lower threshold of 44 N/mm^2 (FF 11). Appellant's results therefore do not reflect the entirety of the claimed range of compression forces.

In addition, Appellant only discusses what he considers to be the upper end of Sumitomo Cement's range (296 parts by volume), a value between the Comparative Examples 9 and 10 (147 parts) and Comparative Examples 11 and 12 (367 parts) (Br. 6; Reply Br. 4). Appellant asks us to compare Comparative Examples 9-12 to the Examples 1-6. But in order to be probative of unexpected results, Appellant must show that the claimed range is critical for achieving the result. We note that the data shows a gradual increase from concentration values within the claimed range (Examples 1-6) to values outside the range such as in Examples 7-16. Appellant has not explained how the data within the claimed range supports criticality of the range for unexpected results.

Appellant has not shown the Examiner reversibly erred in either finding that the process limitation of forming by compressing at a force of at least 44 N/mm^2 as recited in claim 8 does not patentably distinguish the claimed structure from that of Yukinobu, or in concluding that Appellant's

showing of unexpected results was inadequate to overcome the prima facie case of obviousness.

VI. CONCLUSION

Appellant has limited the scope of the arguments to the above issues and does not further contest the Examiner's rejection of the claims. Therefore, we sustain the Examiner's rejection of claims 2, 3, and 8 under 35 U.S.C. § 103(a) as unpatentable over Yukinobu in view of Sumitomo Cement KK.

VII. DECISION

The decision of the Examiner is affirmed.

VIII. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED

cam

CHENG LAW GROUP, PLLC
1100 17TH STREET, N.W.
SUITE 503
WASHINGTON DC 20036